Abstract Submitted
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Characterization of shoaling internal waves from optical fibre cable data using space-time statistics[1] ISHA SHUKLA, Mechanical and Aerospace Engineering, University of California, San Diego, ANDREW LUCAS, Scripps Institution of Oceanography, University of California, San Diego ;Mechanical and Aerospace Engineering, University of California, San Diego, OLIVER SCHMIDT, Mechanical and Aerospace Engineering, University of California, San Diego — A distinctive pattern of shoaling internal waves (IWs) offshore of La Jolla, CA, has been revealed by a temperature sensing array of fibre optics on the sea floor and autonomous wave-powered profiling moorings. The measurements reveal that the end-state of the on-shore propagating IWs exhibits coherent wake structures that radiate in the offshore direction. Previously undocumented, this feature constitutes a non-turbulent mechanism that extracts energy from the shoaling waves. Despite the distinctive signature of the radiating wake, its intermittent and stochastic nature hampers the analysis. We hence use conditional statistics to extract an ensemble of IW structures. Important wave characteristics, like the mean cross/along-shore velocity (ranging from $0.1 - 0.4$ m/s) and wave approach angle (ranging from $70° - 77°$) are obtained from the ensemble mean and using wavelet transforms of the prewhitened data. The entire ensemble of the realization is then used to obtain the dominant coherent wave structure using a space-time proper orthogonal decomposition approach.

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